

The Engineer and the ‘Next Step’

Rex McCardell brought diesel engines to a ferry fleet. What happens to his legacy when the engines are replaced?

SAN FRANCISCO — Rex McCardell’s legacy is strong enough to shake vision until it blurs. It’s powerful enough to shove 99 tons of aluminum from pier to pier. It’s refined enough to have a taste for oil that’s been, well, refined — into No. 2 diesel.

Once the G.T. *San Francisco* settles into a cruising pace toward Sausalito, McCardell’s legacy is tame enough to inoffensively purr against ferry passengers’ shoe soles.

The passengers seated directly above the boat’s Detroit Diesel 12v4000 M60 engine, which McCardell once re-designed the vessel to accommodate, aren’t thinking about this. The motor isn’t as interesting as the whales — *whales!* — off the port side, which draw riders leftward across the deck for a glimpse of the spectacle.

A dad turns back to prop his toddler against a railing, looking down into the rapidly-splitting wake behind the engine’s housing. “Look at how much water the boat is pushing,” he says. His young son obliges with an “Ooh.”

That’s the closest anyone on the ferry’s rear deck comes to talking about the grumbling, rumbling elephant in the engine room below.

It’s also a sign that McCardell’s legacy is fading.

For 35 years, he was a soft-spoken engineer for the Golden Gate Bridge, Highway and Transportation District. Three Spaulding class ferries he engineered and converted to diesel engines still tote riders from San Francisco to Sausalito and Angel Island.

McCardell was a rare combined civil and marine engineer, forged at the U.S. Merchant Marine Academy. He toiled in the engine room of a Liberty ship during World War II's deadly Battle of Okinawa. His proudest achievement was creating a rotisserie that could cook six massive beef cuts at once for a barbecue festival in his childhood hometown of Brisbane, California.

And he was married to Norah, a high school teacher, for more than 50 years. They had no children but traveled wherever they could.

Rex McCardell died in 2018. He was 91.

Survived by pieces of metal and a few friends' aging memories, what's left of McCardell is scattered across the San Francisco Bay, a ghostly trail that's eroding to the river of progress.

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The engine room of the S.S. *Jeremiah O'Brien* is daunting.

Five steep staircases stretch upward from the floor into a cavernous metal maze of pipes and valves.

Because the *O'Brien* is a Liberty ship, this felt familiar to McCardell. The vessel is one of only two Liberty ships still intact and above water. He grew attached to it, volunteering after retirement to maintain it.

“There weren’t many engineers left” who had worked on Liberty ships, said Rex Clack, a maritime attorney and friend McCardell, so his knowledge was vital.

There aren’t many people left around the *O'Brien* who know McCardell, either. On Sunday, the boat’s volunteers found the name Rex no more familiar preceding McCardell than following Tyrannosaurus.

He asked for memorial donations to go to the *O'Brien* after his death, but there’s no sign of him here. Already, McCardell is disappearing.

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McCardell engineered the Spaulding ferries twice: once, powered by gas turbines, and all over again to fit the diesel engines. It wasn’t a like-for-like switch. The vessel’s center of gravity shifted. Weight changed.

“To re-engineer a vessel takes a lot of skill,” Clack said.

It was money-saving progress in the 1980s. Now, those diesel engines are under an environment-saving siege. Electricity is the future of San Francisco’s ferries: more speed, fewer emissions, less weight on a collective aquatic conscience.

The Water Emergency Transit Authority sees a future measured in voltage. About a month ago, the agency, which oversees the Bay's fleets, received almost \$14 million from the state of California to electrify ferry infrastructure.

But futuristic talk from WETA's board of directors, which discussed revitalizing the workforce of shipbuilders and deckhands when it convened Monday, harkened back to the halcyon days.

"If you go back a few generations, the vessels of America were built here," board chair Keith Wunderman said. At the meeting, he endorsed a plan to promote careers developing ships — careers like McCardell's.

"It's such a tremendous way to contribute to society," Wunderman said.

Artemisé Davenport, who leads diversification efforts for the Golden Gate district, McCardell's former employer, backed this renaissance of the trades. "We're going headfirst. We're diving deep," she said.

Still, WETA and the district will make McCardell's work obsolete someday. They have doomed the diesel engines. At some point in the not-too-distant future, Rex McCardell's work will vanish from the ferry system.

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Athenians cared a lot about ship maintenance, or so the myth goes. When Theseus returned from his quest in Crete, the people of Athens preserved his ship, swapping out its wooden planks as they rotted.

In time, they replaced every plank, leaving no original wood. A philosophical thought experiment, attributed to Plutarch, was born: Was it still Theseus' ship, even without any original material?

That question could someday apply to McCardell's ferries. Will they be the same ships, even with new engines or new hulls? It will become harder to spot his influence, to see them as the same.

Maybe this is progress, necessary disappearances to preserve a system.

Surely an engineer like McCardell understood this.

"He was an engineer, and engineers embrace changing technology all the time," Clack said. "His curiosity about the next step was always there."

Surely an engineer like McCardell understood that the Bay Area has ferries as a backup form of transportation in the event of earthquakes. In this sense, ferries must resist earthly motion.

And surely an engineer like McCardell understood that the Earth is always moving, always spinning through space. This is time in a tangible form, like how the rumbles and waves at the back of a ferryboat give shape to the output of an otherwise hidden engine.

McCardell designed his boats to defy the movement of the Earth, to withstand time. This unrelenting progression will change them eventually, but it's what the devout engineer believed in. Rex McCardell's legacy will yield to the next step.